

### Claims

1. A method for distinguishing WHO classified AML subtypes AML\_MLL, t(15;17), t(8;21), inv(16), 11q23, de novo\_AML, s\_AML, t\_AML, AML\_M0, AML\_M1, AML\_M2, AML\_M4, AML\_M5a, AML\_M5b, AML\_M6, AML\_t(15;17)/M3 and/or AML\_t(15;17)/M3v in a sample, the method comprising determining the expression level of markers selected from the markers identifiable by their Affymetrix Identification Numbers (affy id) as defined in Tables 1, 2, 3, 4, 5, 6 and/or 7,
- wherein
- a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 1.1
- is indicative for the presence of AML\_MLL when AML\_MLL is distinguished from all other subtypes,
- and/or wherein
- a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 1.2
- is indicative for the presence of AML\_inv(16) when AML\_inv(16) is distinguished from all other subtypes,
- and/or wherein
- a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 1.3 and/or
- a lower expression of at least one polynucleotide defined by any of the numbers 41 of Table 1.3
- is indicative for the presence of AML\_other when AML\_other is distinguished from all other subtypes,

and/or wherein

5 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 1.4

is indicative for the presence of AML<sub>t</sub>(15;17) when AML<sub>t</sub>(15;17) is distinguished from all other subtypes,

and/or wherein

10 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 1.5

is indicative for the presence of AML<sub>t</sub>(8;21) when AML<sub>t</sub>(8;21) is distinguished from all other subtypes,

15 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 3, 4, 5, 6, 7, 11, 12, 13, 15, 16, 17, 19, 20, 22, 24, 25, 27, 28, 30, 31, 32, 33, 34, 35, 37, 41, 42, 43, 44, 46, 48, and/or 50 of Table 2.1, and or

20 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 8, 9, 10, 14, 18, 21, 23, 26, 29, 36, 38, 39, 40, 45, 47, and/or 49 of Table 2.1,

is indicative for the presence of AML<sub>MLL</sub> when AML<sub>MLL</sub> is distinguished from AML<sub>inv</sub>(16),

25 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 2.2

30 is indicative for the presence of AML<sub>MLL</sub> when AML<sub>MLL</sub> is distinguished from AML<sub>other</sub>,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 5, 6, 7, 8, 9, 11, 13, 15, 18, 20, 22, 24, 25, 26, 27, 29, 30, 33, 34, 35, 36, 41, 44, 46, , and/or 50 of Table 2.3, and/or

5 a higher expression of at least one polynucleotide defined by any of the numbers 4, 10, 12, 14, 16, 17, 19, 21, 23, 28, 31, 32, 37, 38, 39, 40, 42, 43, 45, 47, 48, and/or 49 of Table 2.3

is indicative for the presence of AML\_MLL when AML\_MLL is distinguished from AML\_t(15;17),

and/or wherein

10 a lower expression of at least one polynucleotide defined by any of the numbers 8, 13, 17, 18, 19, 23, 26, 27, 28, 29, 35, 38, 39, 40, 43, 45, and/or 50 of Table 2.4, and/or

15 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 20, 21, 22, 24, 25, 30, 31, 32, 33, 34, 36, 37, 41, 42, 44, 46, 47, 48, and 49 of Table 2.4,

is indicative for the presence of AML\_MLL when AML\_MLL is distinguished from AML\_t(8;21),

and/or wherein

20 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 2.5, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 37 of Table 2.5

25 is indicative for the presence of AML\_inv(16) when AML\_inv(16) is distinguished from AML\_other,

and/or wherein

30 a lower expression of at least one polynucleotide defined by any of the numbers 2, 4, 7, 9, 12, 17, 22, 23, 28, 29, 30, 34, 39, 42, and/or 49 of Table 2.6, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 3, 5, 6, 8, 10, 11, 13, 14, 15, 16, 18, 19, 20, 21, 24, 25, 26,

27, 31, 32, 33, 35, 36, 37, 38, 40, 41, 43, 44, 45, 46, 47, 48, and/or 50 of Table 2.6,

is indicative for the presence of AML\_inv(16) when AML\_inv(16) is distinguished from AML\_t(15;17),

5 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 6, 15, 27, 32, 36, 44, and/or 47, of Table 2.7, and/or

10 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 45, 46, 48, 49, and/or 50 of Table 2.7,

is indicative for the presence of AML\_inv(16) when AML\_inv(16) is distinguished from AML\_t(8;21),

and/or wherein

15 a lower expression of at least one polynucleotide defined by any of the numbers 18, and/or 25 of Table 2.8, and/or

20 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 2.8,

is indicative for AML\_other when AML\_other is distinguished from AML\_t(15;17),

and/or wherein

25 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 2.9,

is indicative for AML\_other when AML\_other is distinguished from AML\_t(8;21),

30 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 4, 7, 11, 14, 16, 18, 22, 23, 24, 25, 27, 29, 31, 32, 33, 36, 37, 38, 41, 42, 43, 47, 48, and/or 49, of Table 2.10,

5 a higher expression of at least one polynucleotide defined by any of the numbers 2, 3, 5, 6, 8, 9, 10, 12, 13, 15, 17, 19, 20, 21, 26, 28, 30, 34, 35, 39, 40, 44, 45, 46, and/or 50 of Table 2.10

is indicative for AML<sub>t</sub>(15;17) when AML<sub>t</sub>(15;17) is distinguished from AML<sub>t</sub>(8;21),

and/or wherein

10 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 3.1,

15 is indicative for denovo\_AML when denovo\_AML is distinguished from all other AML subtypes

and/or wherein

20 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 3.2,

is indicative for s\_AML when s\_AML is distinguished from all other AML subtypes,

and/or wherein

25 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 3.3,

is indicative for t\_AML when t\_AML is distinguished from all other AML subtypes

30 and/or wherein

a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 4.1,

is indicative for denovo\_AML when denovo\_AML is distinguished from s\_AML,

and/or wherein

5 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 4.2,

is indicative for denovo\_AML when denovo\_AML is distinguished from t\_AML

10 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 7, 8, 12, 13, 15, 16, 17, 19, 21, 22, 23, 24, 25, 30, 31, 34, 35, 36, 37, 38, 41, 45, 47, and/or 50 of Table 4.3, and/or

15 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 9, 10, 11, 14, 18, 20, 26, 27, 28, 29, 32, 33, 39, 40, 42, 43, 44, 46, 48, and/or 49 of Table 4.3,

is indicative for s\_AML when s\_AML is distinguished from t\_AML

and/or wherein

20 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 5.1,

is indicative for AML\_M0 when AML\_M0 is distinguished from all other AML subtypes,

25 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 5.2,

30 is indicative for AML\_M1 when AML\_M1 is distinguished from all other AML subtypes

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 5.3, and/or

5 a higher expression of at least one polynucleotide defined by any of the numbers 32 and/or 38 of Table 5.3

is indicative for AML\_M2 when AML\_M2 is distinguished from all other AML subtypes,

and/or wherein

10 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 25, 26, 27, 29, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 5.4, and/or

15 a higher expression a polynucleotide defined by any of the numbers 18, 23, 24, 28, and/or 30 of Table 5.4

is indicative for AML\_M4 when AML\_M4 is distinguished from all other AML subtypes

and/or wherein

20 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 5.5,

is indicative for AML\_M5a when AML\_M5a is distinguished from all other AML subtypes

25 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 39, 40, 42, 43, 44, 46, 48, 49, and/or 50 of Table 5.6, and/or

30 a higher expression of at least one polynucleotide defined by any of the numbers 6, 7, 16, 20, 26, 37, 38, 41, 45, and/or 47 of Table 5.6,

is indicative for AML\_M5b when AML\_M5b is distinguished from all other AML subtypes,

and/or wherein

5 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 5.7,

is indicative for AML\_M6 when AML\_M6 is distinguished from all other AML subtypes,

10 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, and/or 50 of Table 6.1, and/or

15 a higher expression a polynucleotide defined by any of the numbers 36, and/or 49 of Table 6.1

is indicative for AML\_M0 when AML\_M0 is distinguished from AML\_M1,

and/or wherein

20 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 6.2

25 is indicative for AML\_M0 when AML\_M0 is distinguished from AML\_M2,

and/or wherein

30 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 6.3, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 9 of Table 6.3,



is indicative for AML\_M0 when AML\_M0 is distinguished from AML\_M4,

and/or wherein

5 a lower expression of at least one polynucleotide defined by any of the numbers 1, 3, 5, 7, 9, 11, 12, 14, 18, 26, 32, 33, 34, 35, 36, 39, 40, 41, 42, 43, 44, 45, 47, 48, and/or 49, of Table 6.4, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 2, 4, 6, 8, 10, 13, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 37, 38, 46, and/or 50 of Table 6.4,

10 is indicative for AML\_M0 when AML\_M0 is distinguished from AML\_M5a,

and/or wherein

15 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 6.5

is indicative for AML\_M0 when AML\_M0 is distinguished from AML\_M5b

and/or wherein

20 a lower expression of at least one polynucleotide defined by any of the numbers 7, 8, 9, 10, 18, 26, 27, 28, 30, 32, 34, 35, 36, 37, 39, 46, 47, 48, and/or 49, of Table 6.6, and/or

25 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 11, 12, 13, 14, 15, 16, 17, 19, 20, 21, 22, 23, 24, 25, 29, 31, 33, 38, 40, 41, 42, 43, 44, 45, and/or 50 of Table 6.6

is indicative for AML\_M0 when AML\_M0 is distinguished from AML\_M6,

and/or wherein

30 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 40, 41, 42, 44, 45, 46, 47, 48, 49, and/or 50 of Table 6.7

a higher expression of at least one polynucleotide defined by any of the numbers 9, 24, 36, 38, 39, and/or 43, of Table 6.7

is indicative for AML\_M1 when AML\_M1 is distinguished from AML\_M2,

5 and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 13, 15, 17, 18, 19, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 34, 35, 36, 37, 38, 40, 41, 42, 43, 44, 45, 47, 48, 49, and/or 50 of Table 6.8, and/or

10 a higher expression of at least one polynucleotide defined by any of the numbers 3, 12, 14, 16, 20, 23, 33, 39, and/or 46 of Table 6.8,

is indicative for AML\_M1 when AML\_M1 is distinguished from AML\_M4,

and/or wherein

15 a lower expression of at least one polynucleotide defined by any of the numbers 23, 25, and/or 47, of Table 6.9, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 48, 49, and/or 50 of Table 6.9,

20

is indicative for AML\_M1 when AML\_M1 is distinguished from AML\_M5a,

and/or wherein

25 a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, 18, 20, 22, 23, 24, 26, 28, 29, 31, 32, 33, 35, 38, 40, 41, 42, 45, 46, 48, 49, and/or 50 of Table 6.10, and/or

30 a higher expression of at least one polynucleotide defined by any of the numbers 6, 16, 19, 21, 25, 27, 30, 34, 36, 37, 39, 43, 44, and/or 47 of Table 6.10

is indicative for AML\_M1 when AML\_M1 is distinguished from AML\_M5b,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 19, 22, 38, and/or 45, of Table 6.11, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 39, 40, 41, 42, 43, 44, 46, 47, 48, 49, and/or 50 of Table 6.11

is indicative for AML\_M1 when AML\_M1 is distinguished from AML\_M6,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 43, 45, 46, 47, 49, and/or 50 of Table 6.12, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 14, 15, 19, 27, 40, 41, 42, 44, and/or 48 of table 6.12,

is indicative for AML\_M2 when AML\_M2 is distinguished from AML\_M4,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 12 of Table 6.13, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 6.13

is indicative for AML\_M2 when AML\_M2 is distinguished from AML\_M5a,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 21, 23, 24, 25, 26, 28, 32, 33, 34, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 49, and/or 50 of Table 6.14, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 13, 17, 22, 27, 29, 30, 31, 35, 36, 46, and/or 48 of Table 6.14,

is indicative for AML\_M2 when AML\_M2 is distinguished from AML\_M5b,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 26, 36, and/or 46, of Table 6.15, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, and/or 50 of Table 6.15

is indicative for AML\_M2 when AML\_M2 is distinguished from AML\_M6,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 18, 21, 25, 28, 29, 36, 40, 43, and/or 46, of Table 6.16, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 19, 20, 22, 23, 24, 26, 27, 30, 31, 32, 33, 34, 35, 37, 38, 39, 41, 42, 44, 45, 47, 48, 49, and/or 50 of Table 6.16

is indicative for AML\_M4 when AML\_M4 is distinguished from AML\_M5a,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 7, 9, 10, 12, 13, 15, 18, 19, 22, 25, 26, 28, 31, 32, 33, 37, 38, 40, 42, 47, and/or 50 of Table 6.17, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 5, 6, 8, 11, 14, 16, 17, 20, 21, 23, 24, 27, 29, 30, 34, 35, 36, 39, 41, 43, 44, 45, 46, 48, and/or 49 of Table 6.17,

is indicative for AML\_M4 when AML\_M4 is distinguished from AML\_M5b,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 39, 40, 41, and/or 47 of Table 6.18, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 42, 43, 44, 45, 46, 48, 49, and/or 50 of Table 6.18,

5 is indicative for AML\_M4 when AML\_M4 is distinguished from AML\_M6,

and/or wherein

10 a lower expression of at least one polynucleotide defined by any of the numbers 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 26, 27, 28, 29, 31, 34, 35, 36, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 6.19, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 1, 7, 22, 25, 30, 32, 33, and/or 37 of Table 6.19,

15 is indicative for AML\_M5a when AML\_M5a is distinguished from AML\_M5b,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 15, 17, 18, 20, 23, 28, 29, 31, 37, 43, 44, 45, 46, and/or 48, of Table 6.20,

20 a higher expression of at least one polynucleotide defined by any of the numbers 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 19, 21, 22, 24, 25, 26, 27, 30, 32, 33, 34, 35, 36, 38, 39, 40, 41, 42, 47, 49, and/or 50 of Table 6.20

25 is indicative for AML\_M5a when AML\_M5a is distinguished from AML\_M6,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 40, and/or 48, of Table 6.21, and/or

30 a higher expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 41, 42, 43, 44, 45, 46, 47, 49, and/or 50 of Table 6.21

is indicative for AML\_M5b when AML\_M5b is distinguished from AML\_M6,

and/or wherein

a lower expression of at least one polynucleotide defined by any of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, and/or 50 of Table 7, and/or

a higher expression of at least one polynucleotide defined by any of the numbers 16, 17, and/or 25, of Table 7

is indicative for AML\_M3 when AML\_M3 is distinguished from AML\_M3v.

2. The method according to claim 1 wherein the polynucleotide is labelled.

3. The method according to claim 1 or 2, wherein the label is a luminescent, preferably a fluorescent label, an enzymatic or a radioactive label.

4. The method according at least one of the claims 1-3, wherein the expression level of at least two, preferably of at least ten, more preferably of at least 25, most preferably of 50 of the markers of at least one of the Tables 1-7 is determined.

5. The method according to at least one of the claims 1-4, wherein the expression level of markers expressed lower in a first subtype than in at least one second subtype, which differs from the first subtype, is at least 5 %, 10% or 20%, more preferred at least 50% or may even be 75% or 100%, i.e. 2-fold lower, preferably at least 10-fold, more preferably at least 50-fold, and most preferably at least 100-fold lower in the first subtype.

6. The method according to at least one of the claims 1-4, wherein the expression level of markers expressed higher in a first subtype than in at

least one second subtype, which differs from the first subtype, is at least 5 %, 10% or 20%, more preferred at least 50% or may even be 75% or 100%, i.e. 2-fold higher, preferably at least 10-fold, more preferably at least 50-fold, and most preferably at least 100-fold higher in the first subtype.

5

7. The method according to at least one of the claims 1-6, wherein the sample is from an individual having AML.

10

8. The method according to at least one of the claims 1-7, wherein at least one polynucleotide is in the form of a transcribed polynucleotide, or a portion thereof.

15

9. The method according to claim 8, wherein the transcribed polynucleotide is a mRNA or a cDNA.

20

10. The method according to claim 8 or 9, wherein the determining of the expression level comprises hybridizing the transcribed polynucleotide to a complementary polynucleotide, or a portion thereof, under stringent hybridization conditions.

25

11. The method according to at least one of the claims 1-7, wherein at least one polynucleotide is in the form of a polypeptide, or a portion thereof.

12. The method according to at least one of the claims 8, 9 or 12, wherein the determining of the expression level comprises contacting the polynucleotide or the polypeptide with a compound specifically binding to the polynucleotide or the polypeptide.

30

13. The method according to claim 12, wherein the compound is an antibody, or a fragment thereof.

14. The method according to at least one of the claims 1-13, wherein the method is carried out on an array.
- 5 15. The method according to at least one of the claims 1-14, wherein the method is carried out in a robotics system.
16. The method according to at least one of the claims 1-15, wherein the method is carried out using microfluidics.
- 10 17. Use of at least one marker as defined in at least one of the claims 1-3 for the manufacturing of a diagnostic for distinguishing WHO classified AML subtypes AML\_MLL, t(15;17), t(8;21), inv(16), 11q23, de novo\_AML, s\_AML, t\_AML, AML\_M0, AML\_M1, AML\_M2, AML\_M4, AML\_M5a, 15 AML\_M5b, AML\_M6, AML\_t(15;17)/M3 and/or AML\_t(15;17)/M3v.
18. The use according to claim 17 for distinguishing AML\_MLL, t(15;17), t(8;21), inv(16), 11q23, de novo\_AML, s\_AML, t\_AML, AML\_M0, AML\_M1, AML\_M2, AML\_M4, AML\_M5a, AML\_M5b, AML\_M6, 20 AML\_t(15;17)/M3 and/or AML\_t(15;17)/M3v in an individual having AML.
19. A diagnostic kit containing at least one marker as defined in at least one of the claims 1-3 for distinguishing WHO classified AML subtypes 25 AML\_MLL, t(15;17), t(8;21), inv(16), 11q23, de novo\_AML, s\_AML, t\_AML, AML\_M0, AML\_M1, AML\_M2, AML\_M4, AML\_M5a, AML\_M5b, AML\_M6, AML\_t(15;17)/M3 and/or AML\_t(15;17)/M3v, in combination with suitable auxiliaries.



20. The diagnostic kit according to claim 19, wherein the kit contains a reference for the AML\_MLL, t(15;17), t(8;21), inv(16), 11q23, de novo\_AML, s\_AML, t\_AML, AML\_M0, AML\_M1, AML\_M2, AML\_M4, AML\_M5a, AML\_M5b, AML\_M6, AML\_t(15;17)/M3 and/or AML\_t(15;17)/M3v subtype.
21. The diagnostic kit according to claim 20, wherein the reference is a sample or a data bank.
22. An apparatus for distinguishing AML subtype AML\_MLL, t(15;17), t(8;21), inv(16), 11q23, de novo\_AML, s\_AML, t\_AML, AML\_M0, AML\_M1, AML\_M2, AML\_M4, AML\_M5a, AML\_M5b, AML\_M6, AML\_t(15;17)/M3 and/or AML\_t(15;17)/M3v in a sample containing a reference data bank.
23. The apparatus according to claim 22, wherein the reference data bank is obtainable by comprising
- (a) compiling a gene expression profile of a patient sample by determining the expression level of at least one marker selected from the markers identifiable by their Affymetrix Identification Numbers (affy id) as defined in Tables 1, 2, 3, 4, 5, 6 and/or 7, and
  - (b) classifying the gene expression profile by means of a machine learning algorithm.
24. The apparatus according to claim 23, wherein the machine learning algorithm is selected from the group consisting of Weighted Voting, K-Nearest Neighbors, Decision Tree Induction, Support Vector Machines, and Feed-Forward Neural Networks, preferably Support Vector Machines.
25. The apparatus according to at least one of the claims 22-24, wherein the apparatus contains a control panel and/or a monitor.

26. A reference data bank for distinguishing WHO classified AML subtype AML\_MLL, t(15;17), t(8;21), inv(16), 11q23, de novo\_AML, s\_AML, t\_AML, AML\_M0, AML\_M1, AML\_M2, AML\_M4, AML\_M5a, AML\_M5b, AML\_M6, AML\_t(15;17)/M3 and/or AML\_t(15;17)/M3v obtainable by comprising
- 5 (a) compiling a gene expression profile of a patient sample by determining the expression level of at least one marker selected from the markers identifiable by their Affymetrix Identification Numbers (affy id) as defined in Tables 1, 2, 3, 4, 5, 6 and/or 7, and
- 10 (b) classifying the gene expression profile by means of a machine learning algorithm.
27. The reference data bank according to claim 26, wherein the reference data bank is backed up and/or contained in a computational memory chip.